



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/664,078	09/17/2003	Mizuki Nagai	2003_1338	5067
513	7590	01/11/2005	EXAMINER	
WENDEROTH, LIND & PONACK, L.L.P. 2033 K STREET N. W. SUITE 800 WASHINGTON, DC 20006-1021			WONG, EDNA	
			ART UNIT	PAPER NUMBER
			1753	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/664,078

Applicant(s)

NAGAI ET AL.

Examiner

Edna Wong

Art Unit

1753

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 17 September 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☒ Certified copies of the priority documents have been received in Application No. 09/893,624.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date September 17, 2003.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

### ***Drawings***

Figures 40A and 40B should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.121(d)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Applicants' specification discloses that "Fig. 40A and 40B are cross-sectional views illustrating the state of a seed layer and a void which has been formed according to a conventional method" (page 11, line 24-26). Thus, it is deemed that Figs. 40A and 40B are prior art.

### ***Specification***

I. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information

Art Unit: 1753

given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

The abstract of the disclosure is objected to because the abstract is more than one paragraph long. Correction is required. See MPEP § 608.01(b).

II. The disclosure is objected to because of the following informalities:

page 1, line 1, the related application statement, the words -- , now US Patent No. 6,709,563 – should be inserted after the number "2001".

page 7, line 4, the word "provide" should be amended to the word -- provides --.

page 11, line 6, the word "FIG." should be amended to the word -- FIGS. --.

page 11, line 24, the word "FIG." should be amended to the word -- FIGS. --.

page 20, line 15, the word -- the -- should be inserted after the word "during".

page 29, lines 7 and 8, reference character "444" has been used to designate both an engaging surface and a disk-shaped rotatable member (from page 28, line 17). Thus, it is unclear what reference character "444" designates.

---

page 31, line 5, the word -- member -- should be inserted after the word

"holding".

page 33, line 26, the number "226" should be amended to the number -- 22b --.

page 34, line 8, the word "cholin" should be amended to the word -- choline --.

page 38, line 28, the word "inst ad" should be amended to the word -- instead --.

page 38, line 28, the word "th " should be amended to the word -- the --.

page 38, line 28, the word "s ction" should be amended to the word -- section --.

page 41, line 10, the word "Cholin" should be amended to the word -- Choline --.

page 45, line 7, the word "Cholin" should be amended to the word -- Choline --.

page 47, line 11, the number "4" should be amended to the number -- 104 --.

page 50, line 13, the word "dame" should be amended to the word -- dam --.

---

page 52, line 25, the words -- (not shown) -- should be inserted after the number

Art Unit: 1753

"365".

page 58, line 3, the number "510" (both occurrences) should be amended to the number -- 531 --.

Appropriate correction is required.

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim **38** is rejected under 35 U.S.C. 103(a) as being unpatentable over **Dordi et al.** (US Patent No. 6,267,853 B1) in combination with **Cheung et al.** (US Patent No. 6,258,223 B1) and **Cross** (US Patent No. 4,217,182).

Dordi teaches a method for filling a metal into fine recesses in a surface of a

Art Unit: 1753

substrate, comprising:

(a) providing a substrate having fine recesses (= features) [col. 4, lines 3-6]

covered with a seed layer in a surface of the substrate;

(b) reinforcing the seed layer (= seed layer repair) by contacting the surface of the seed layer in a first plating liquid having ions of a metal (= electroless deposition fluid) [col. 12, lines 21-29 and 56-57; and col. 27, lines 24-25];

(c) filling said fine recesses (= depositions in features) [col. 4, lines 3-6] with the metal by electroplating a surface of the reinforced seed layer with contacting the substrate in a second plating liquid (col. 27, lines 26-39); and

(d) removing the metal on an edge portion of the substrate (= edge bead removal) by supplying an etching liquid (= an etchant) to a surface of the metal on the edge portion of the substrate (= substantially equal exposure to the etchant at the peripheral portion of the wafer) [col. 10, line 64 to col. 11, line 2; and col. 28, lines 5-17].

Dordi does not teach wherein the first plating liquid has a complexing agent.

However, Cheung teaches an electroless deposition fluid that enhances the seed layer (col. 4, lines 59-61). The electroless deposition fluid comprises a copper source and a complexing agent (col. 4, lines 20-58).

---

Thus, the invention as a whole would have been obvious to one having ordinary

skill in the art at the time the invention was made to have modified the method of Dordi with wherein the first plating liquid has a complexing agent because Dordi teaches that one or more electroless deposition cells or modules are disposed in the see layer repair station. The electroless deposition cells perform an electroless deposition process (col. 12, lines 21-29). A first conduit, through which an electroless deposition fluid flows, is coupled to the cell (col. 12, lines 56-57).

Dordi does not disclose the composition of the electroless deposition fluid. However, electroless deposition fluids are known in the art as taught by Cheung which enhances the seed layer (col. 4, lines 59-61; and col. 4, lines 20-58). It has been held that the selection of a known material based on its suitability for its intended use supports a prima facie obviousness determination. See MPEP § 2144.06 and § 2144.07.

As to washing a surface of the metal on the substrate with water or washing liquid comprising water; wherein the washing the surface of the metal is performed prior to the removing of the metal on the edge portion of the substrate, Dordi teaches that after the electroplating process has been completed, the wafer is transferred into the EBR/SRD module. An edge bead removal process is performed to remove excess deposition at the edge portion of the wafer, and then, the wafer is cleaned using a spin-rinse-dry process in the EBR/SRD module using deionized water or a combination of deionized water and a cleaning fluid (col. 28, lines 5-17).



It would have been obvious to one having ordinary skill in the art to have performed the washing the surface of the metal prior to the removing of the metal on the edge portion of the substrate because:

(a) the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results. See *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946); and

(b) it is conventional in the art to wash after every method step as taught by Cross (Fig. 1).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Edna Wong whose telephone number is (571) 272-1349. The examiner can normally be reached on Mon-Fri 7:30 am to 3:30 pm, Flex Schedule.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen can be reached on (571) 272-1342. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

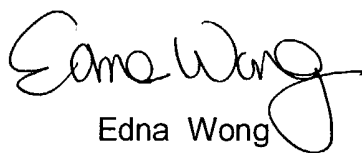
Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic

Application/Control Number: 10/664,078

Page 9

Art Unit: 1753

Business Center (EBC) at 866-217-9197 (toll-free).

A handwritten signature in black ink, appearing to read "Edna Wong". The signature is fluid and cursive, with the first name "Edna" and last name "Wong" clearly distinguishable.

Edna Wong  
Primary Examiner  
Art Unit 1753

EW  
January 7, 2005